

***LEPIDOSTOMA (NOSOPUS) OZARKENSE* (TRICHOPTERA: LEPIDOSTOMATIDAE), A NEW SPECIES FROM ARKANSAS¹**

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ABSTRACT: *Lepidostoma (Nosopus) ozarkense*, a new species from northern Arkansas and eastern Oklahoma belonging to the *Modestum* Group, is described. The distinctive male and female genitalia are described and figured. The spring emerging adults were taken near small streams which may dry up in summer. Details of the physicochemical and biological characteristics of the toptotypical stream are given.

While surveying benthic organisms of intermittent streams, Harp collected examples, both adult and larvae, of a number of Trichoptera that were sent to Flint for identification. In these collections a species of *Lepidostoma* that appeared to be undescribed was discovered. Consequently, correspondence with D.E. Bowles at the University of Arkansas revealed that he had additional examples of this species from other localities in Arkansas and Oklahoma. The recently published revision of the New World species of *Lepidostoma* (Weaver 1988) confirms that this species is heretofore unknown.

***Lepidostoma (Nosopus) ozarkense* Flint & Harp, new species**

Adult: Length of forewing, male 6—7mm, female 7—7.5mm, color in alcohol uniformly dark brown. Venation in both sexes typical of group (Weaver 1988, Figs. 46a, 46b). Male with scape about 3 times as long as broad; maxillary palpus apparently one-segmented, filled mesally with long spatulate hairs (essentially as in Weaver 1988, Fig. 32). Male genitalia (Figs. 1-4): Ninth segment annular, widened ventrally, with a ventrolateral brace. Tenth tergum elongate, blunt apically, with scattered setae arising from protuberant bases; with a narrow, dorsomesal incision about a third length of segment, with a darkened, internal sclerotization around base of incision; with a basoventral process as long as dorsal lobe and tapering to an apical point in both dorsal and lateral aspects. Clasper with basodorsal process rather straight, apex truncate in dorsal and obliquely truncate in ventral aspect, lying on segment one; segment one slightly inflated basally, hirsute ventrolaterally, membranous mesoventrally, curved and bluntly pointed mesad; segment two a small subapical lobe directed mesad. Phallus lacking sclerotized parameres, but with a bilobed, apicodorsal, membranous appendage; apex slightly decurved, with a darkened internal phallosomal sclerite, beyond which it is membranous. Female genitalia (Figs. 5-6): Eighth sternum with lateral fourths strongly sclerotized, almost square in shape, concave, connected mesally by a lightly sclerotized band along anterior margin. Ninth tergum with a long anterolateral apodeme, ventral margin strongly concave; dorsally with a distinct projection subapically. Membrane ventrolaterally between eighth and ninth segments bearing convoluted sclerotized and semisclerotized bands. Vaginal sclerite in ventral aspect with

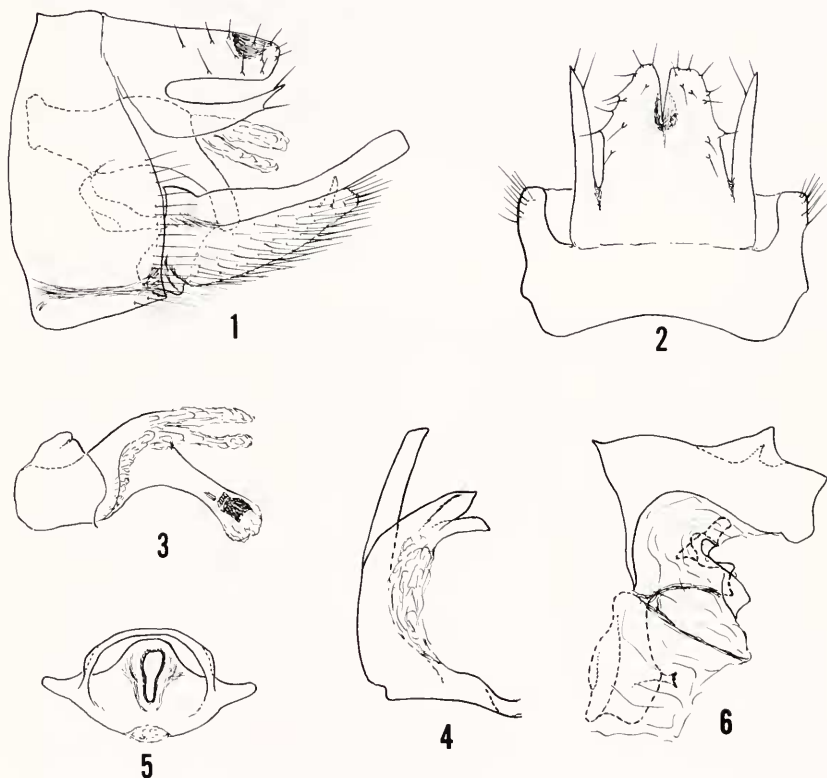
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an arcuate posterior bridge, with lateral angles projecting, centrally with a keyhole-like opening.

Material: Holotype, male: U.S.A., Arkansas, Independence Co., unnamed stream (T11N, R6W, Sec. 2 SW1/4), 5.6km N Pleasant Plains on US Hwy 167, 18 April 1987, Phoebe A. Harp. NMNH Type. Paratypes: Same data, 2 males, 7 females; same, but 21 Mar 1987, 1 male. Johnson Co., spring-run, 7mi W Oark on Hwy 215, 16 Apr 1987, D.E. Bowles, UV light, 1 male; Sulphur Creek, 89mi N Hagarville on Hwy 123, 29 Mar 1986, C.D. Rowbotham, lab reared, 1 male. Logan Co., Mt. Magazine, Gutter Rock Creek, 6 May 1988, Bowles & Mathis, UV light, 1 male, 2 females; same, but 14 May 1988, D.E. Bowles, UV light, 1 male; same, but Dripping Springs, Gutter Rock Creek, 20 Apr 1987, sweeping, 19 males, 14 females. Pope Co., Petite Jean State Park, SW slope, stuck to fire pink near ephemeral stream, 16 Apr 1988, R. Leschen, 1 male. Oklahoma, Latimer Co., Robbers Cave State Park, Rough Canyon spring run, 2 Apr 1988, D.E. Bowles, 12 males, 2 females. Paratypes deposited in collections at Arkansas State University (Department of Biological Sciences), University of Arkansas (Department of Entomology), and National Museum of Natural History.



Figs. 1-6. *Lepidostoma (Nosopus) ozarkense* n.sp. 1, male genitalia, lateral. 2, male ninth and tenth terga, dorsal. 3, male phallus, lateral. 4, male clasper, ventral. 5, female vaginal sclerite, ventral. 6, female genitalia, lateral.

This species is a member of the *Modestum* Group (Weaver 1988:35) and is closely related to *L. ontario* Ross. These are the only two species in which the males possess a basoventral process from the tenth tergum and the only apparently significant and consistent difference between them lies in the length and shape of this process. In *ozarkense* the process is only as long as the tenth tergum and is pointed in both lateral and dorsal aspects. However, in *ontario* this process is almost 1.5 times as long as the tenth tergum, and, although it may appear pointed or furcate in lateral aspect depending on the angle, in dorsal aspect it is flattened, curved, widened and shallowly furcate apicad (Ross 1941, Fig. 98; Weaver 1988, Fig. 72). The females are quite similar in all species of the group, and specific differences are less certain. However, the lightly sclerotized, convoluted bands ventrad of the ninth tergum and the projecting lateral angle of the vaginal sclerite in *ozarkense* appear to be diagnostic.

DISCUSSION

This species brings to seven the number of species described in the *Modestum* Group, all of which are limited to eastern North America. Four of the species, *lydia* Ross, *modestum* (Banks), *ontario* Ross, and *pic-tile* (Banks), have rather similar distributions, running in general from Newfoundland or Quebec south along the Appalachian Mountains into the western Carolinas or northwestern Georgia (cf. Fig. 7, the distribution of *ontario*). Three species appear to have very restricted ranges: *compressum* Etnier & Way in Cumberland Co., Tennessee, *weaveri* Harris in Tuscaloosa Co., Alabama, and *ozarkense* n.sp. in Independence, Johnson, Logan, and Pope Cos., Arkansas and Latimer Co., Oklahoma. All of these species occupy areas outside the broad range of *ontario*. This pattern is suggestive of either relictual distributions resulting from expanding and contracting ranges related to earlier advances and retreats of ice sheets, or random dispersal events from the main range of the species group.

ECOLOGICAL - BIOLOGICAL DATA

The topotypical stream, an intermittently flowing second-order tributary of Salado Creek, is located in the Boston Mountains of the Ozark Plateau. The sampling site (Fig. 8) was a 100m stretch of the stream which parallels highway US 167, approximately 0.8km south of the

Salado Creek bridge (Harp 1988). The stream margins are heavily forested, primarily with loblolly pine (*Pinus taeda* L.), shortleaf pine (*Pinus echinata* Mill.), eastern redcedar (*Juniperus virginiana* L.), southern red oak (*Quercus falcata* Michx.), and white oak (*Quercus alba* L.).

Selected physicochemical parameters were measured from 27 Dec 1986 through 18 Jul 1987 (Table 1). This unnamed intermittent stream is a slightly acidic, soft-water stream. Alkalinity ranged between 19–88ppm with the highest values recorded during low flow. The pH ranged from 6.6–7.0, averaging 6.7. The low alkalinity and pH values reflect the soil type, Enders stony fine sand loam (Ferguson *et al.* 1982).

Flow volume measured 120–300,000cc/sec. Temperature ranges included: water 5.0–27.5°C. and air, -1.5–28°C. The first adult *Lepidostoma ozarkense*, a male, was taken on 21 March. Flow peaked on this date; water temperature was 15°C, and air temperature 24°C. The remaining specimens were collected on 18 April. On this date the flow measured

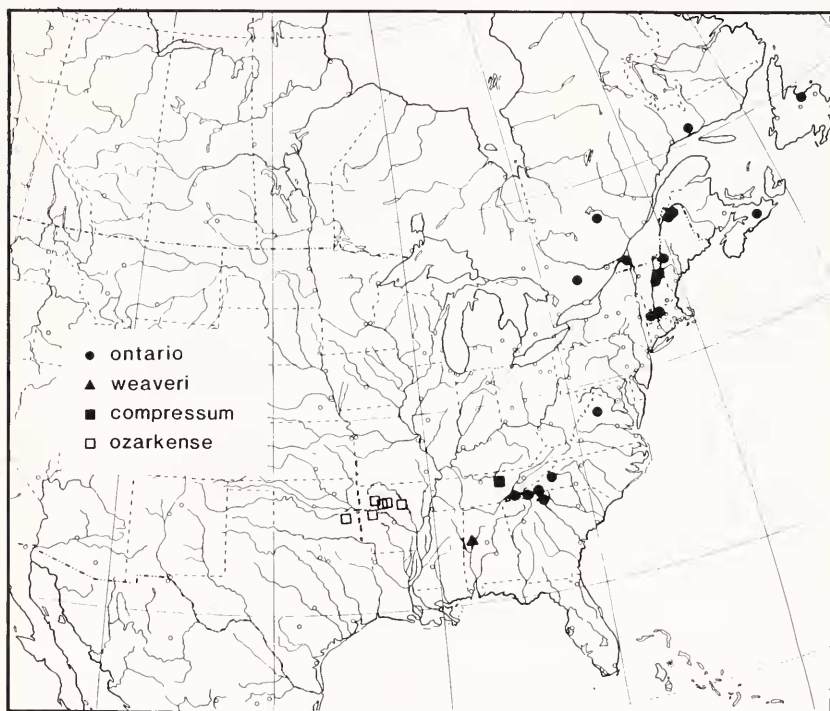


Fig. 7. Recorded distributions of *Lepidostoma* (*Nosopus*) *ontario* Ross, *L. weaveri* Harris, *L. compressum*, Etnier & Way, and *ozarkense* n.sp.



Fig. 8. Topotypic habit of *Lepidostoma (Nosopus) ozarkense* n.sp.

19,000cc/sec; water temperature was 14.5°C, and the air was 25°C. Thus this trichopteran was present during high flow and when water temperature was above 14°C.

Aquatic samples, totalling fifteen, were taken twice monthly, each the result of a two hour collecting period. A Turtox Indestructable Dip Net was the primary collecting instrument, but smaller samples were taken from a Tyler Standard Screen (mesh size 0.295mm) after disturbing the bottom. Adults, which were taken incidentally, were not included in the sample statistics. The aquatic stages of a minimum of 54 taxa were collected in the samples. Of these taxa, 46 were insectan: 12 beetles, 10 stoneflies, 8 caddisflies, 6 flies, 5 mayflies, 4 water bugs, and 1 fishfly. The eleven most common insects (numbers 10 and 11 had identical counts), in order of abundance, were: *Amphinemura delosa* (Ricker), *Prosimulium* spp., *Pseudocloeon* spp., *Ameletus* spp., *Isoperla* spp., *Agapetus illini* Ross, *Neophylax concinnus* McLachlan, *Clioperla* sp., *Tipula* spp., *Stenonema femoratum* (Say), and *Perlesta* spp. A paper presenting the full results of the survey is being prepared by the junior author.

Table 1. Selected physicochemical parameters in an unnamed intermittent stream, Independence County, Arkansas, 27 December 1986 - 18 July 1987.

Date	Dec 27	Jan 11	Jan 24	Feb 7	Feb 21	Mar 7	Mar 21	Apr 4	Apr 18	May 2	May 16	May 30	Jun 20	Jul 4	Jul 18
Air Temp., C	9.0	4.9	-1.5	15.0	9.0	17.5	24.0	9.5	25.0	23.5	26.5	21.0	28.0	26.0	27.5
Water Temp., C	7.5	6.5	5.0	7.5	7.5	10.0	15.0	9.0	14.5	16.5	18.0	19.0	19.0	*	22.0
Mean depth, cm	10	12	8	16	17	11	16	11	4	3	1	3	8	4	4
Mean width, m	2.7	3.0	2.5	2.6	3.7	3.5	3.4	3.1	2.8	0.6	0.2	0.6	1.1	0.7	0.4
Current flow, cm/sec	38	75	54	34	54	67	100	60	27	*	12	25	25	12	6
Current factors	0.7	0.7	0.7	0.7	0.5	0.7	0.7	0.5	0.7	0.5	0.5	0.7	0.5	0.25	0.6
Volume flow, 1000 cc/sec	59	156	64	80	137	144	300	79	19	*	0.12	2	9	7	0.5
Alkalinity, ppm	26	19	23	27	29	23	27	21	28	34	52	55	*	88	72
pH	6.7	6.7	6.6	6.8	6.7	6.7	6.9	6.7	6.7	7.0	6.7	6.9	6.7	6.5	6.7

* Not available for this date.

Although 37 *Lepidostoma* larvae (fifteenth in order of abundance) were collected at the topotypical site, they were not reared, and we feel it wisest not to risk an erroneous association at this time. Both Bowles and Harp are planning work on the immature stages of this species.

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